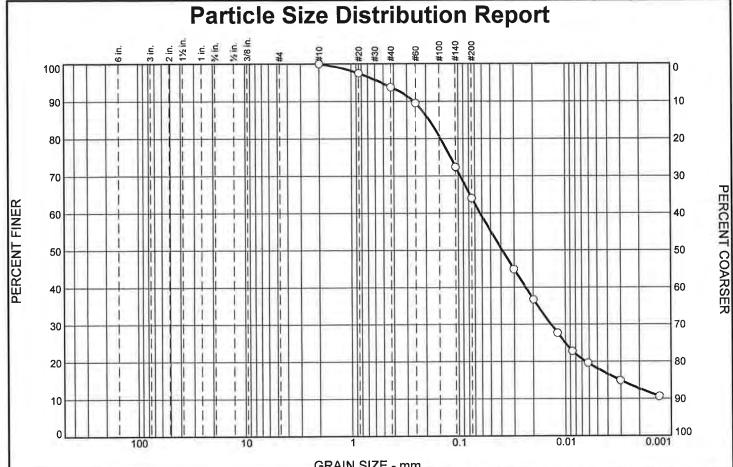
MOISTURE & DENSITY TEST ISI Lab No.: G-52743 2636-001.0 Client: URS/ARUP/HMM JV Project: California High Speed Train Job no: S0071R S0071R S0071R S0071R S0071R Boring # Sample # SS02 MC07-1 MC13-2 MC23-2 SS30 Depth (ft.) 6.0-6.5 31.0-31.5 60.5-61.0 110.5-111.0 146.0-146.5 Soil type: (visual) Dark grayish Greenish gray Grayish brown Greenish gray silty Dark greenish brown clay sandy clay sand gray silty clay clay 11/15/13 11/18/13 11/15/13 11. 1. Date tested: 11/27/13 11/18/13 2. Tested by: JH JΗ JH JΗ JΗ 3. Specimen height (in.) 4.29 5.80 6.00 4. Wt. of specimen + tare (gm) 655.23 1154.64 854.80 5. Tare wt. (gm) 0.00 204.06 0.00 2.42 2.43 6. Diameter (in.) 2.43 7. Wet wt. of soil + dish wt. (gm) 76.56 247.39 304.58 263.49 71.33 8. Dry wt. of soil + dish wt. (gm) 67.33 212.90 271.35 209.28 62.92 30.38 50.39 9. Wt. of dish (gm) 51.14 50.70 30.34 9. 10. Dish ID 10. Wet Density (pcf) 125.4 135.6 116.9 Dry Density (pcf) 103.3 117.9 87.2 **Moisture Content (%)** 25.0 21.3 15.1 34.1 25.8 Gs (Assumed) 2.70 2.70 2.70 2.70 2.70 2.70 2.70 2.70 Void Ratio 0.631 0.429 0.932 Saturation (%) 94.7 98.8 91.3 Additional data: Wt. of dry soil + dish before washing (gm) Wt. of dry soil + dish after washing (gm) % Passing # 200 sieve USCS symbol

MOISTURE & DENSITY TEST ISI Lab No.: G-52923 Client: URS/ARUP/HMM JV Project: California High Speed Train Job no: 2636-001.0 S0072R S0072R S0073R Boring # S0071R Sample # MC03-2 MC10-2 MC22-1 MC15-2 Depth (ft.) 40.5-41.0 65.5-66.0 10.5-11.0 101.0-101.5 Soil type: (visual) Olive brown clay Olive brown sandy Olive gray clay Grayish brown fat with sand clay clay 01/16/14 01/15/14 1. Date tested: 01/16/14 01/16/14 2. Tested by: JH JΗ JH JΗ 3. Specimen height (in.) 5.70 5.69 5.07 5.70 4. Wt. of specimen + tare (gm) 827.13 911.75 809.21 761.54 5. Tare wt. (gm) 0.00 0.00 0.00 0.00 2.41 2.41 6. Diameter (in.) 2.41 2.42 7. Wet wt. of soil + dish wt. (gm) 278.22 330.48 269.70 197.27 8. Dry wt. of soil + dish wt. (gm) 228.86 287.82 216.15 167.76 51.10 9. Wt. of dish (gm) 50.79 51.23 50.95 9. 10. Dish ID 10. Wet Density (pcf) 121.1 133.7 117.5 125.3 Dry Density (pcf) 94.8 113.3 88.7 100.0 **Moisture Content (%)** 27.7 18.0 32.4 25.3 Gs (Assumed) 2.70 2.70 2.70 2.70 2.70 2.70 2.70 2.70 Void Ratio 0.777 0.487 0.899 0.684 Saturation (%) 96.3 99.8 99.9 97.4 Additional data: Wt. of dry soil + dish before washing (gm) Wt. of dry soil + dish after washing (gm) % Passing # 200 sieve USCS symbol



	% Gr	Gravel % Sand				% I	Fines
% +3"	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	6	30	46	18

SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#10	100		
#20	98	1	
#40	94		
#60	90		
#140	72		
#200	64		
0.0304 mm.	45		
0.0199 mm.	37		
0.0119 mm.	28		
0.0086 mm.	23		
0.0061 mm.	20		
0.0031 mm.	15		
0.0013 mm.	11		

5	30	46	18
	Dark olive brown	Soil Description n sandy silt with clay	
	PL=	Atterberg Limits	PI=
	D ₉₀ = 0.2606 D ₅₀ = 0.0392 D ₁₀ =	Coefficients D ₈₅ = 0.1879 D ₃₀ = 0.0137 C _u =	D ₆₀ = 0.0627 D ₁₅ = 0.0031 C _c =
	USCS=	Classification AASHTO	=
	F.M.=0.34	Remarks	

Source of Sample: S0071R G-52743 Sample Number: SS04

Depth: 16.0-16.5

Date: 11/11/13



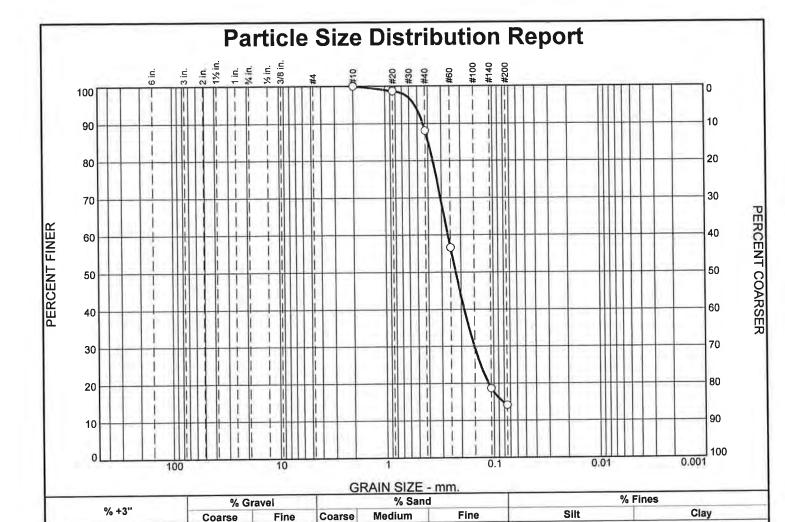
Client: URS/ARUP/HMM JV

Project: California High Speed Train

Project No: 2636-001.0

Figure

Tested By: AM



P	PERCENT FINER	1	EC.* CENT	PASS? (X=NO)
	100	i i		
	99			
	88			
	57			
	19			
	14)
		1		

Coarse

12	7	4		14
	Gray sand		Soil Description	
	PL=		Atterberg Limits LL=	PI=
	D ₉₀ = 0.4 D ₅₀ = 0.3 D ₁₀ =	4454 2247	Coefficients D85= 0.3968 D30= 0.1519 Cu=	D ₆₀ = 0.2637 D ₁₅ = 0.0820 C _c =
	USCS=		Classification AASH1	го=
	F.M.=1.0	6	Remarks	

(no specification provided)

Source of Sample: S0071R G-52743 Sample Number: SS06

0

Depth: 26.0-26.5

Date: 11/15/13

Figure

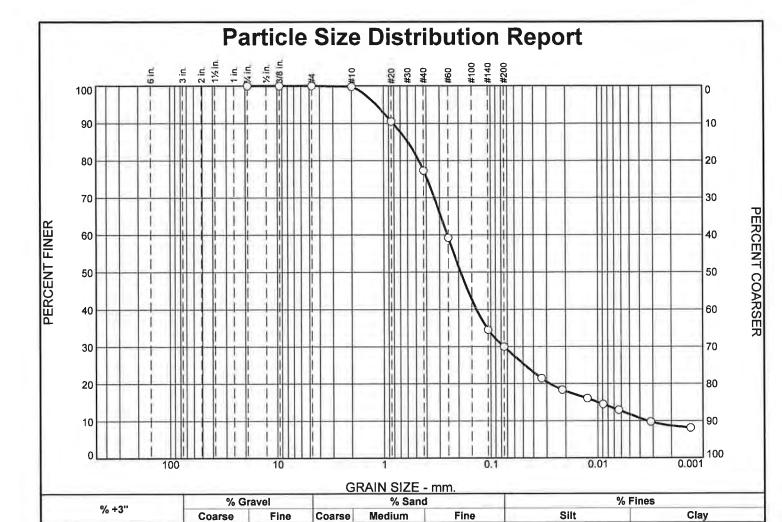


Client: URS/ARUP/HMM JV

Project: California High Speed Train

Project No: 2636-001.0

Tested By: SB



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
3/4	100		
3/8	100		
#4	100		
#10	100		
#20	91		
#40	77		
#60	59		
#140	35	A 1	
#200	30		
0.0337 mm.	21		
0.0215 mm.	18		
0.0126 mm.	16		
0.0089 mm.	15		
0.0063 mm.	13		
0.0031 mm.	10		
0.0013 mm.	8		

	Soil Description	
Olive gray sand v	vith silt	
PL=	Atterberg Limits LL=	PI=
D ₉₀ = 0.8190 D ₅₀ = 0.1917 D ₁₀ = 0.0033	Coefficients D ₈₅ = 0.5974 D ₃₀ = 0.0750 C _u = 76.39	D ₆₀ = 0.2555 D ₁₅ = 0.0099 C _c = 6.59
USCS=	Classification AASHTO)=
F.M.=1.12	Remarks	

Source of Sample: S0071R G-52743 Sample Number: SS08

0

Depth: 36.0-36.5

Client: URS/ARUP/HMM JV

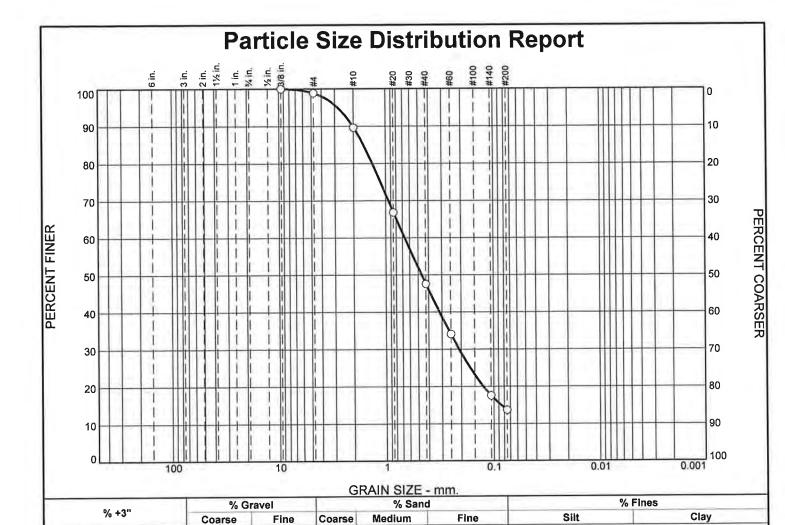
Project: California High Speed Train

Project No: 2636-001.0

Figure

Date: 11/13/15

Tested By: AM



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
3/8	100		
#4	99		
#10	90		
#20	67		
#40	48		
#60	34		
#140	18		
#200	14		
	1		
	1 1		

0

42	34		14
	Gray sand	Soil Description	
	PL=	Atterberg Limits	PI=
	D ₉₀ = 2.0396 D ₅₀ = 0.4655 D ₁₀ =	Coefficients D85= 1.6242 D30= 0.2100 Cu	D ₆₀ = 0.6689 D ₁₅ = 0.0849 C _c =
	USCS=	Classification AASHTO)=
	F.M.=2.14	Remarks	

* (no specification provided)

Source of Sample: S0071R G-52743 Sample Number: SS10

0

Depth: 46.0-46.5

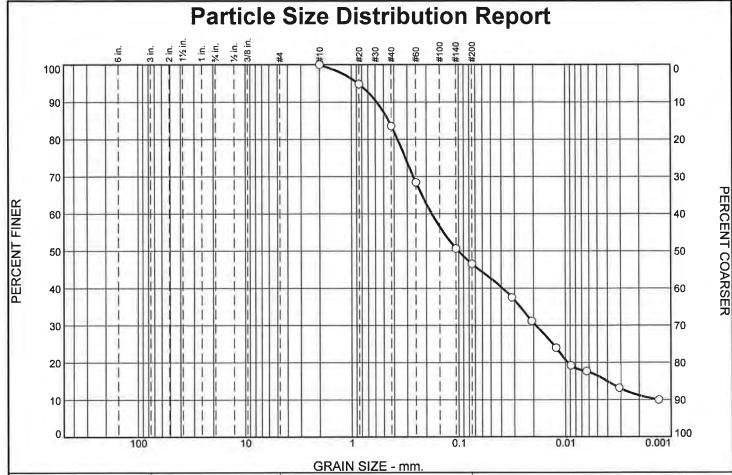
Client: URS/ARUP/HMM JV

Project: California High Speed Train

Project No: 2636-001.0

Figure

Date: 11/15/13



% Gravel % Sand % Fines % +3" Fine Coarse Medium Fine Silt Clay Coarse 37 0 0 16 16

SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#10	100		
#20	95	V	
#40	84	l (
#60	68		
#140	51		
#200	47		
0.0319 mm.	38		
0.0207 mm.	31		
0.0123 mm.	24		
0.0089 mm.	19		
0.0063 mm.	18		
0.0031 mm.	13	1	
0.0013 mm.	10	V.	

	Soil Description	
Olive brown silty	y sand with clay	
PL=	Atterberg Limits LL=	PI=
D ₉₀ = 0.5817 D ₅₀ = 0.1008 D ₁₀ =	Coefficients D85= 0.4508 D30= 0.0191 Cu=	D ₆₀ = 0.1783 D ₁₅ = 0.0040 C _c =
USCS=	Classification AASHT	O=
F.M.=0.82	Remarks	
USCS=	Classification AASHT0	-

(no specification provided)

Source of Sample: \$0071R G-52743 Sample Number: \$\$14\$

Depth: 66.0-66.5

Date: 11/13/13

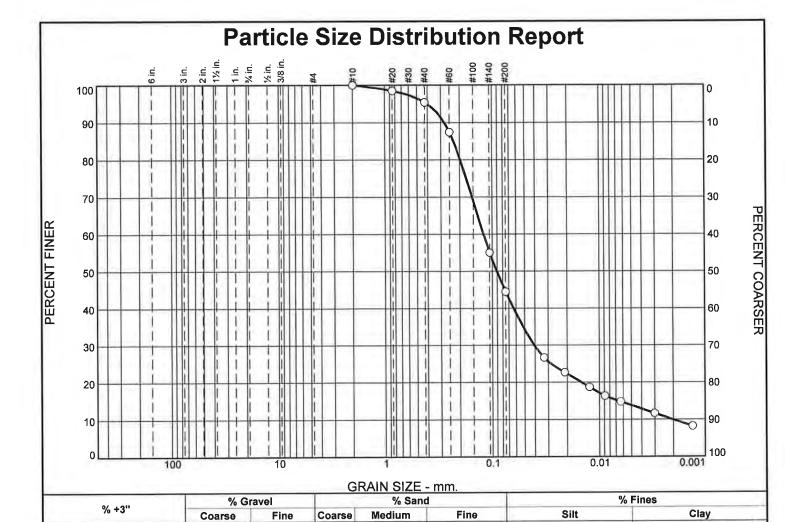
Figure



Client: URS/ARUP/HMM JV

Project: California High Speed Train

Project No: 2636-001.0



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#10	100		
#20	99		
#40	95		
#60	87		
#140	55		
#200	45		
0.0330 mm.	27		
0.0212 mm.	23		
0.0125 mm.	19		
0.0089 mm.	16		
0.0063 mm.	15		
0.0030 mm.	12		
0.0013 mm.	8		

5	50	31	14
	Olive gray silty s	Soil Description and	
	PL=	Atterberg Limits LL=	PI=
	D ₉₀ = 0.2795 D ₅₀ = 0.0908 D ₁₀ = 0.0020	Coefficients D ₈₅ = 0.2300 D ₃₀ = 0.0407 C _u = 59.51	D ₆₀ = 0.1210 D ₁₅ = 0.0066 C _c = 6.75
	USCS=	Classification AASHTO)=
	F.M.=0.43	Remarks	

Source of Sample: S0071R G-52743 Sample Number: SS16

0

Depth: 76.0-76.5

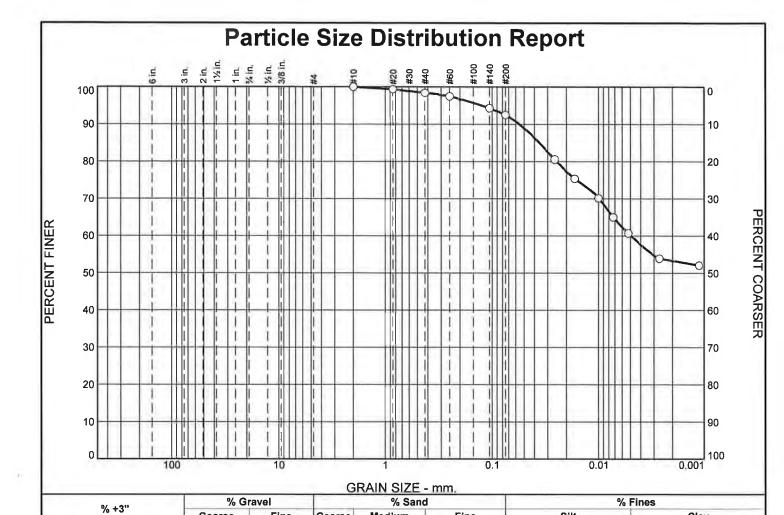
Date: 11/13/13

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Figure Project No: 2636-001.0

Tested By: JH



Medium

Fine

#10 100 #20 99 #40 98 #60 97 #140 94 #200 93 0.0258 mm. 0.0169 mm. 75 0.0100 mm. 70 0.0073 mm. 65 0.0027 mm. 54	SIEVE	PERCENT	SPEC.*	PASS?
#20 99 #40 98 #60 97 #140 94 #200 93 0.0258 mm. 81 0.0169 mm. 75 0.0100 mm. 70 0.0073 mm. 65 0.0053 mm. 61	SIZE	FINER	PERCENT	(X=NO)
#40 98 #60 97 #140 94 #200 93 0.0258 mm. 81 0.0169 mm. 75 0.0100 mm. 70 0.0073 mm. 65 0.0053 mm. 61	#10	100		
#60 97 #140 94 #200 93 0.0258 mm. 81 0.0169 mm. 75 0.0100 mm. 70 0.0073 mm. 65 0.0053 mm. 61	#20	99		
#140	#40	98		
#200 93 0.0258 mm. 81 0.0169 mm. 75 0.0100 mm. 70 0.0073 mm. 65 0.0053 mm. 61	#60	97		
0.0258 mm. 81 0.0169 mm. 75 0.0100 mm. 70 0.0073 mm. 65 0.0053 mm. 61	#140	94		
0.0169 mm. 75 0.0100 mm. 70 0.0073 mm. 65 0.0053 mm. 61	#200	93		
0.0100 mm. 70 0.0073 mm. 65 0.0053 mm. 61	0.0258 mm.	81		
0.0073 mm. 65 0.0053 mm. 61	0.0169 mm.	75		
0.0053 mm. 61	0.0100 mm.	70		
	0.0073 mm.	65		
0.0027 mm. 54	0.0053 mm.	61		
	0.0027 mm.	54		
0.0011 mm. 52	0.0011 mm.	52		

Coarse

0

Fine

Coarse

2		5	33	60
	Dark	colive brown	Soil Description a silty clay	
	PL=		Atterberg Limits LL=	PI=
	D ₉₀ D ₅₀ D ₁₀	= 0.0556 = =	Coefficients D ₈₅ = 0.0363 D ₃₀ = C _u =	D ₆₀ = 0.0049 D ₁₅ = C _c =
	USC	S=	Classification AASHTC)=
	F.M.	=0.08	Remarks	

Silt

(no specification provided)

0

Source of Sample: S0071R G-52743 Sample Number: SS20

Depth: 96.0-96.5

Date: 11/13/13

Clay

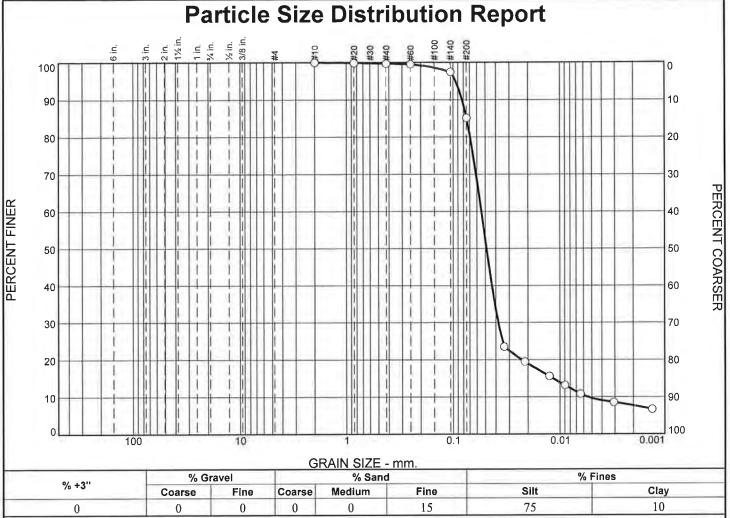
أزاً

Client: URS/ARUP/HMM JV

Project: California High-Speed-Train

Project No: 2636-001.0 Figure

Tested By: JH



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#10	100		
#20	100	1	
#40	100		
#60	100		
#140	97		
#200	85		
0.0335 mm.	24		
0.0215 mm.	20		
0.0126 mm.	16		
0.0090 mm.	13		
0.0064 mm.	11		
0.0031 mm.	9		
0.0013 mm.	7		
	1 0	1	

Greenish gray si	Soil Description It with sand	
PL=	Atterberg Limits	PI=
D ₉₀ = 0.0824 D ₅₀ = 0.0489 D ₁₀ = 0.0054	Coefficients D ₈₅ = 0.0748 D ₃₀ = 0.0380 C _u = 10.09	D ₆₀ = 0.0546 D ₁₅ = 0.0117 C _c = 4.88
USCS=	Classification AASHTO)=
F.M.=0.02	Remarks	

Source of Sample: S0071R G-52743 Sample Number: SS24

Depth: 116.0-116.5

Date: 11/13/13



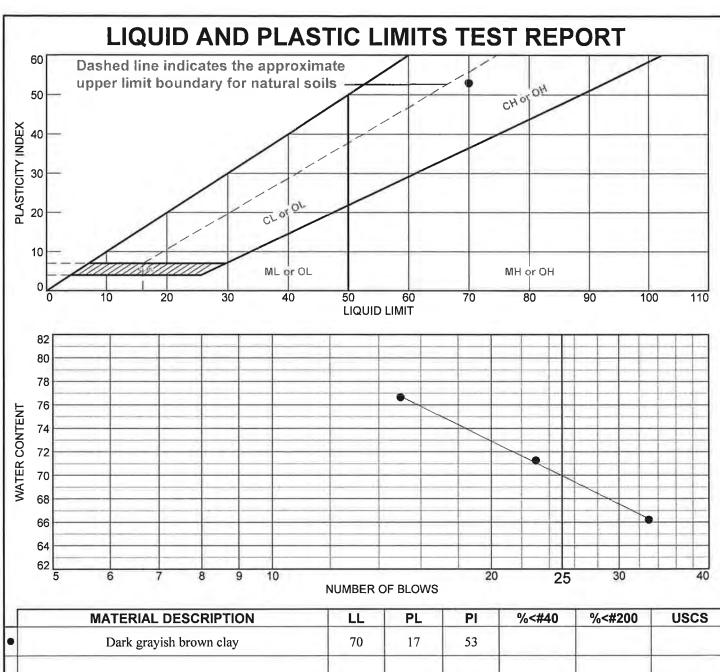
Client: URS/ARUP/HMM JV

Project: California High Speed Train

Project No: 2636-001.0

Figure

Tested By: AM



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
	Dark grayish brown clay	70	17	53			
-							
-							

Project No. 2636-001.0 Client: URS/ARUP/HMM JV

Project: California High Speed Train

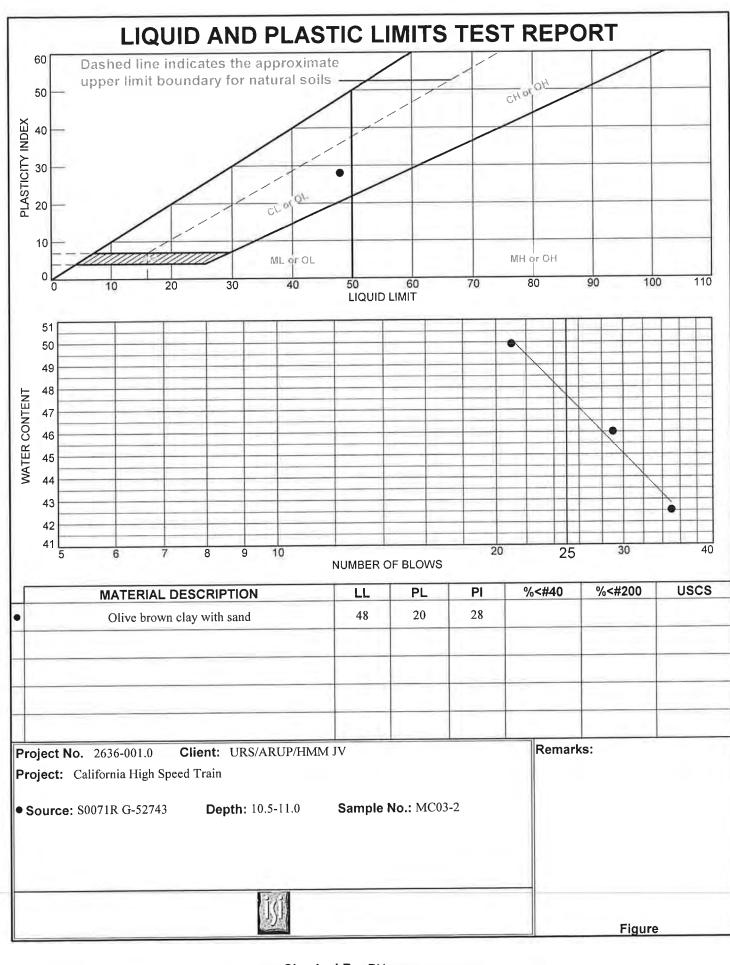
• **Source:** S0071R G-52743

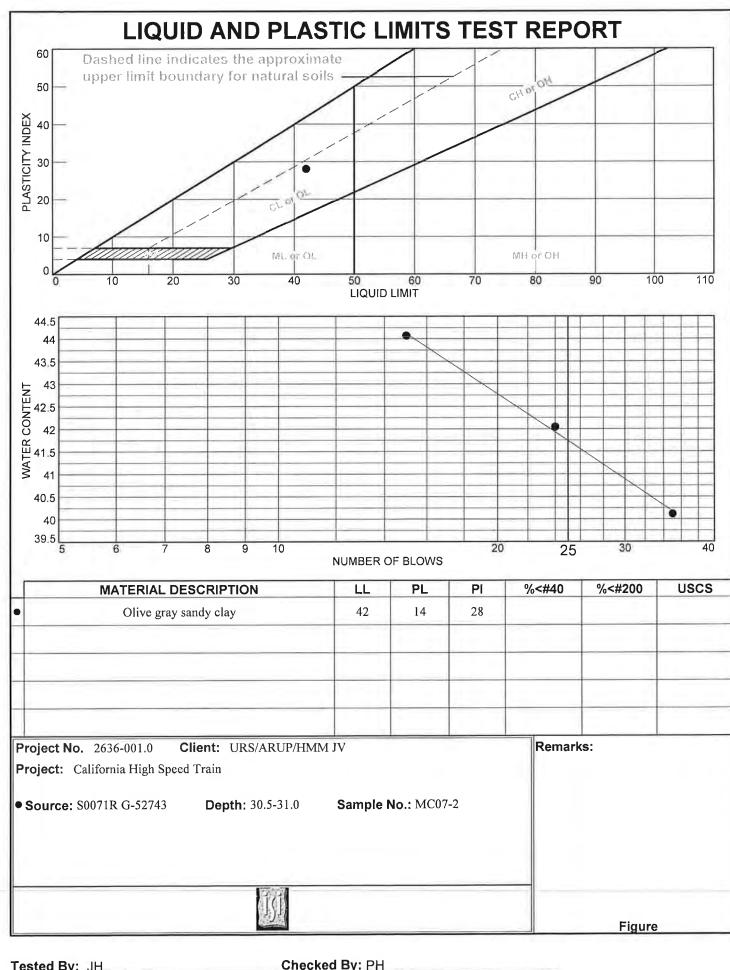
Depth: 6.0-6.5

Sample No.: SS02

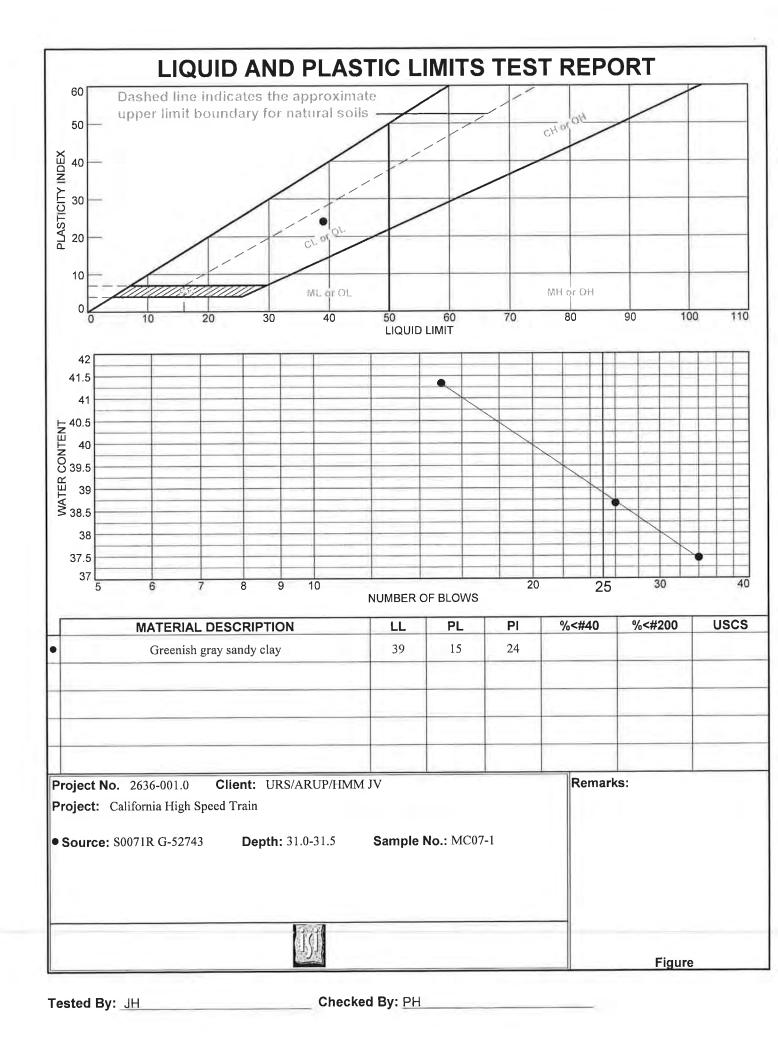
Remarks:

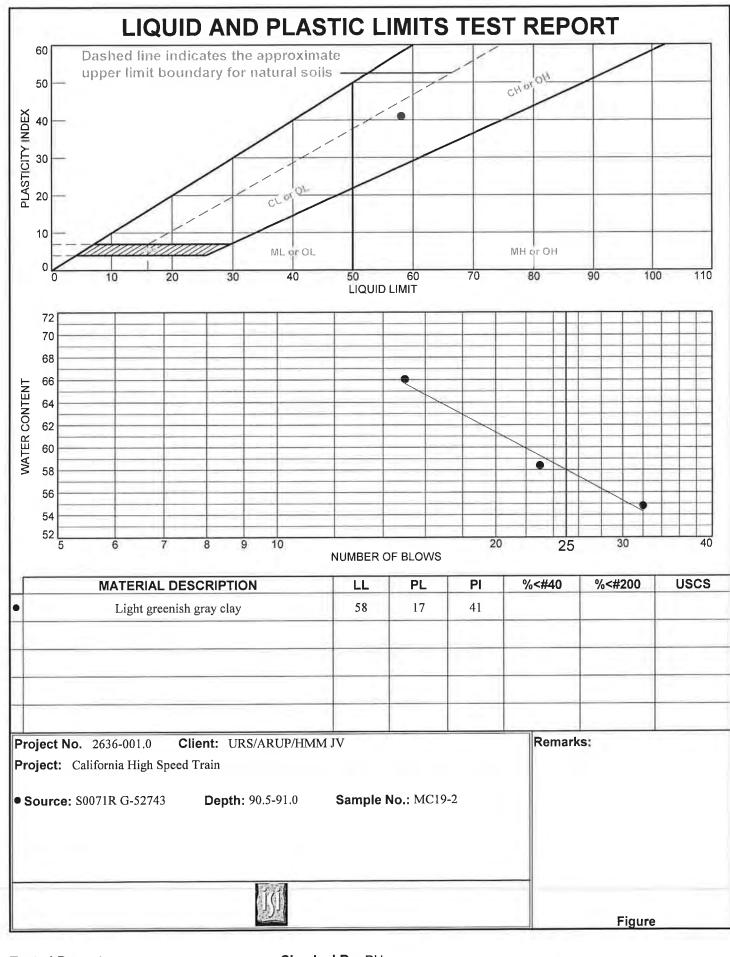


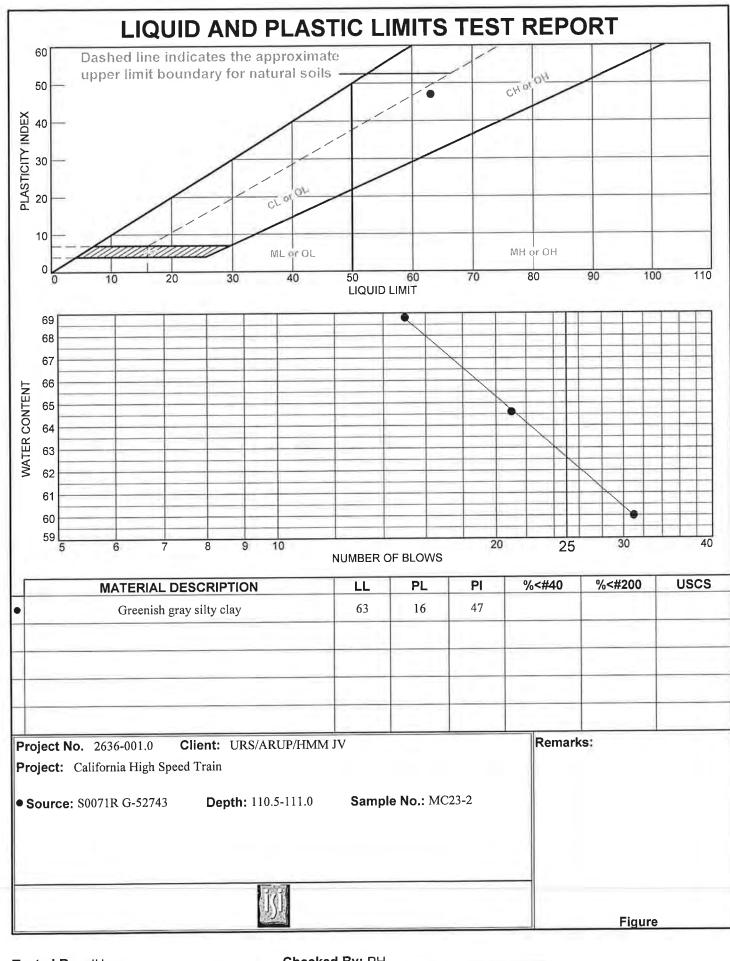


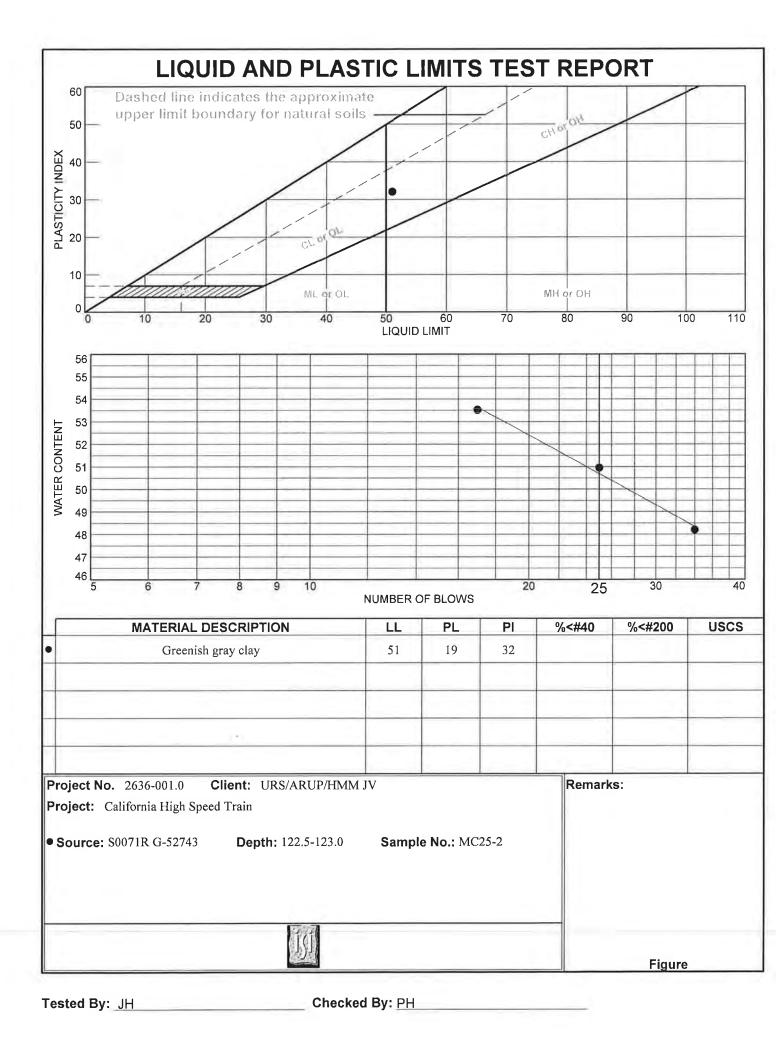


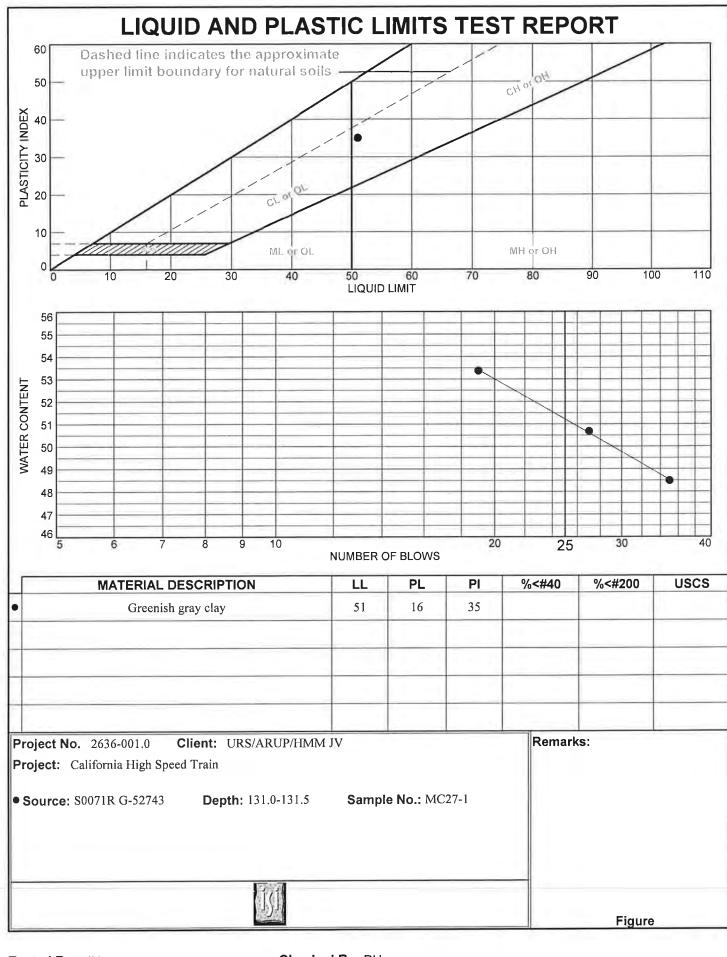
Checked By: PH Tested By: JH

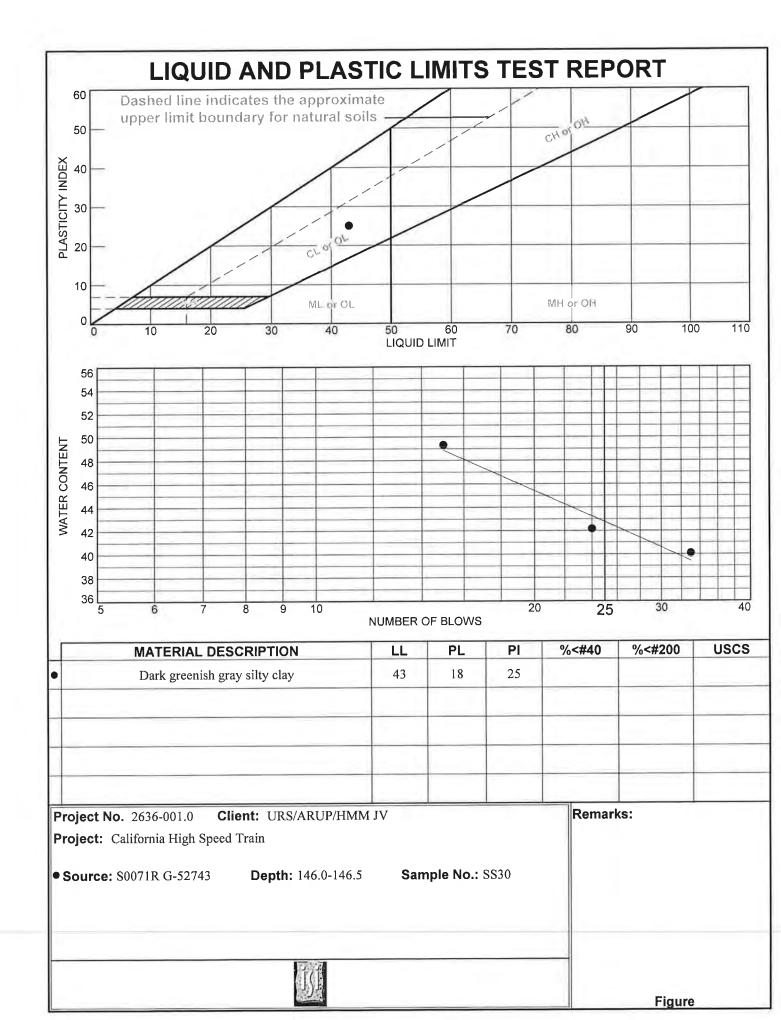












Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job # : 2636-001.0 Data Reduction:

Boring # S0071R

 Sample # : MC17-1
 Dial factor = 1.0 in/unit

 Depth (ft) : 81.0-81.5
 Load factor = 1.0 lb/unit

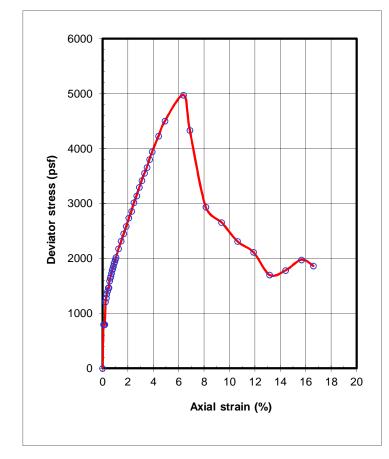
Date tested: 11/23/13

Soil: Grayish brown silty clay (slickensided)

Specimen:	Total wt. =	941.3	gms	
	Ht. =	6.000	in	
	Ave dia. =	2.420	in	
	Area =	4.601	sq.in	
	Volume =	452.4	C.C.	
	Shearing rate =	0.06	inch/min	
	Shearing rate =	1	%/min	

Gs (assumed) = 2.70

Test Report:	Void ratio=	0.590	
	Ht/Dia ratio=	2.48	
	Moisture =	22.5	%
	Total density=	129.8	pcf
	Dry density =	106.0	pcf
	Saturation=	103.0	%
	Chamber pressure=	11520	psf
	Max. deviator stress=	4975	psf
	Strain @ failure=	6.37	%



0.002		0.00	0.0
0.003	25.5	0.08	796.0
0.005	25.5	0.13	795.6
0.009	25.5	0.18	795.2
0.012	38.9	0.24	1213.9
0.015	41.1	0.29	1282.6
0.018	43.3	0.34	1350.4
0.021	45.2	0.39	1409.5
0.025	47.0	0.44	1465.4
0.028	47.0	0.50	1464.6
0.030	51.0	0.54	1588.8
0.034	52.7	0.60	1639.9
0.037	54.0	0.65	1678.9
0.040	55.6	0.70	1729.3
0.043	57.6	0.75	1787.6
0.046	58.5	0.81	1816.2
0.050	59.9	0.86	1859.2
0.052	61.5	0.91	1907.9
0.056	62.6	0.96	1940.7
0.058	63.9	1.01	1979.8
0.062	65.2	1.06	2019.8
0.073	70.4	1.26	2176.1
0.086	75.1	1.47	2315.3
0.098	79.7	1.67	2453.3
0.110	84.2	1.87	2587.3
0.122	89.2	2.07	2734.4
0.135	93.6	2.28	2861.0
0.146	98.8	2.48	3016.0
0.159	103.1	2.68	3140.8
0.171	108.3	2.89	3292.8
0.183	112.7	3.08	3418.7
0.195	117.3	3.29	3549.4
0.208	121.2	3.49	3659.3
0.219	126.2	3.69	3804.7
0.232	131.0	3.90	3939.3
0.262	141.4	4.41	4229.7
0.292	151.3	4.91	4501.4
0.380	169.8	6.37	4975.2
0.410	148.6	6.87	4330.9
0.485	102.2	8.12	2937.4
0.560	93.6	9.37	2656.0
0.636	82.6	10.63	2309.0
0.711	76.6	11.88	2111.3
0.786	62.5	13.14	1699.8
0.861	66.5	14.39	1781.1
0.936 0.993	74.9 71.4	15.64 16.59	1976.9 1864.0
0.993	11.4	10.59	1004.0

Axial

Strain

(%)

0.00

Dial

-0.002

Load

Read. Read.

Deviator

Stress

(psf)

0.0







Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job # : 2636-001.0 Data Reduction:

 Boring # S0071R

 Sample # : MC19-1
 Dial factor = 1.0 in/unit

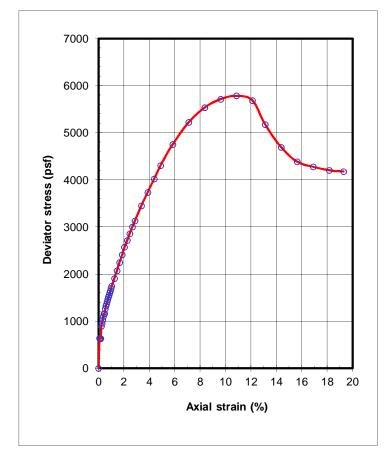
 Depth (ft) : 91
 Load factor = 1.0 lb/unit

Date tested: 11/28/13

Soil: Olive gray clay

Specimen:	Total wt. =	879.5	gms	
	Ht. =	5.980	in	
	Ave dia. =	2.420	in	
	Area =	4.601	sq.in	
	Volume =	450.9	c.c.	
	Shearing rate =	0.04	inch/min	
	Shearing rate =	0.75	%/min	
	Gs (assumed) =	2.70		

Test Report:	Void ratio=	0.782	
	Ht/Dia ratio =	2.47	
	Moisture =	28.7	%
	Total density=	121.7	pcf
	Dry density =	94.6	pcf
	Saturation =	99.1	%
	Chamber pressure=	12960	psf
	Max. deviator stress=	5787	psf
	Strain @ failure=	10.85	%



0.002		0.00	0.0
0.003	20.3	0.07	635.5
0.006	20.3	0.12	635.2
0.009	20.3	0.17	634.9
0.012	28.8	0.22	898.3
0.015	30.6	0.27	956.0
0.018	33.0	0.33	1027.9
0.021	35.3	0.38	1099.7
0.024	37.2	0.43	1160.2
0.027	37.2	0.48	1159.6
0.030	40.5	0.53	1260.8
0.033	42.6	0.58	1324.5
0.036	43.9	0.63	1365.2
0.039	45.7	0.68	1421.4
0.042	47.2	0.73	1466.0
0.046	48.7	0.79	1513.4
0.048	50.2	0.84	1558.9
0.051	51.7	0.89	1602.2
0.054	53.1	0.94	1645.2
0.058	54.7	0.99	1695.4
0.061	56.3	1.04	1744.8
0.073	61.7	1.25	1906.9
0.085	67.1	1.45	2070.9
0.097	73.1	1.65	2249.5
0.109	78.5	1.85	2411.1
0.121	84.0	2.05	2574.9
0.133	88.7	2.25	2714.0
0.145	93.8	2.46	2862.4
0.157	98.6	2.66	3004.1
0.170	103.1	2.86	3132.8
0.200	114.2	3.37	3453.4
0.230	124.2	3.88	3737.6
0.260	134.5	4.38	4023.4
0.290	144.7	4.88	4308.6
0.347	161.4	5.84	4755.4
0.423	179.7	7.09	5223.6
0.498	193.1	8.35	5538.0
0.572	202.0	9.60	5715.4
0.647	207.4	10.85	5787.4
0.722	206.8	12.11	5688.8
0.782	190.4	13.11	5177.4
0.857	175.3	14.37	4697.2
0.932	166.2	15.62	4388.7
1.008	164.5	16.88	4279.8
1.083	164.2	18.13	4206.7
1.151	165.4	19.28	4177.9

Axial

Strain

(%)

0.00

Dial

-0.002

Read.

Load

Read.

Deviator

Stress

(psf)

0.0









Data Reduction:

Dial

Load

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job #: 2636-001.0 Boring # S0071R

Sample #: MC23-1 Dial factor = 1.0 in/unit Depth (ft): 111 Load factor = 1.0 lb/unit

Date tested: 11/28/13

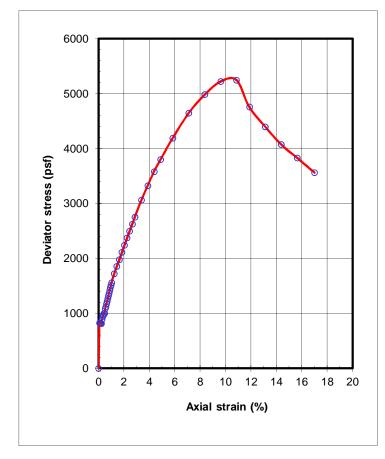
Soil: Greenish gray clay

Specimen: Total wt. = 872.6 gms Ht. = 6.000 in

Ave dia. = 2.427 in Area = 4.627 sq.in Volume = 454.9 c.c. Shearing rate = 0.05 inch/min Shearing rate = 0.75 %/min Gs (assumed) = 2.70

Test Report: Void ratio = 0.848 Ht/Dia ratio = 2.47 Moisture = 31.3 Total density= 119.7 pcf Dry density = 91.2 pcf Saturation = 99.6 %

Chamber pressure = 14400 psf Max. deviator stress= 5247 psf Strain @ failure = 10.86 %



Diai	Luau	Strain	011699
Read.	Read.	(%)	(psf)
-0.002		0.00	0.0
0.003	26.7	0.07	828.9
0.006	26.7	0.12	828.5
0.009	26.7	0.17	828.1
0.012	26.2	0.22	813.0
0.015	28.7	0.27	892.3
0.018	30.4	0.32	942.6
0.021	31.2	0.37	966.6
0.024	32.3	0.42	1001.2
0.027	32.3	0.47	1000.7
0.030	35.2	0.52	1089.5
0.033	36.4	0.57	1126.4
0.036	38.1	0.62	1177.5
0.039	39.5	0.68	1221.4
0.042	41.1 42.9	0.73 0.78	1268.8 1323.9
0.043	44.4	0.78	1369.8
0.051	46.1	0.88	1423.1
0.054	47.7	0.93	1470.9
0.057	49.2	0.98	1515.3
0.060	50.7	1.03	1562.6
0.072	56.1	1.23	1724.2
0.085	60.5	1.44	1857.3
0.097	64.6	1.64	1977.6
0.109	69.2	1.84	2113.9
0.121	73.5	2.04	2239.6
0.133	78.0	2.25	2373.2
0.145	82.3	2.45	2498.9
0.158	86.6	2.65	2623.3
0.170 0.200	91.1 101.7	2.86	2754.7 3059.9
0.200	111.2	3.36 3.87	3327.1
0.260	120.4	4.37	3583.0
0.291	128.4	4.88	3801.7
0.349	143.0	5.84	4191.0
0.424	160.7	7.10	4645.7
0.499	174.7	8.35	4982.7
0.575	185.6	9.61	5221.1
0.650	189.1	10.86	5246.6
0.710	173.4	11.86	4755.3
0.785	162.6	13.12	4395.8
0.860	152.9	14.37	4073.9
0.936	145.9	15.63	3830.5
1.018	137.9	17.00	3561.3

Axial

Strain

Deviator

Stress



69-52743 SOOTIR MC23-1 111-11115 TXVV





Dial factor =

Load factor =

Dial

1.0

1.0

Load

Read. Read.

in/unit

lb/unit

Axial

Strain

(%)

Deviator

Stress

(psf)

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job # : 2636-001.0 Data Reduction:

Boring # S0071R Sample # : MC25-2 Depth (ft) : 122.5

Date tested: 12/02/13

Soil: Greenish gray clay

Specimen: Total wt. = 792.9 gms Ht. = 5.700 in

Ave dia. = 2.420 in

Area = 4.601 sq.in

Volume = 429.8 c.c.

Shearing rate = 0.03 inch/min

Shearing rate = 0.5 %/min

Gs (assumed) = 2.70

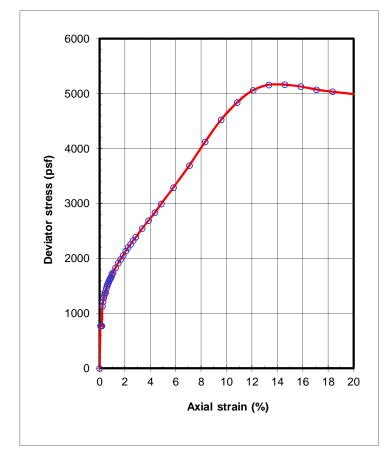
Test Report: Void ratio = 0.980Ht/Dia ratio = 2.36Moisture = 35.3

Total density= 115.1 pcf
Dry density = 85.1 pcf
Saturation = 97.2 %

Chamber pressure = 18000 psf

Max. deviator stress = 5163 psf

Strain @ failure = 14.57 %



0.002		0.00	0.0
0.003	24.7	0.07	773.6
0.006	24.7	0.13	773.1
0.009	24.7	0.18	772.8
0.011	36.2	0.13	1129.7
0.014	39.0	0.28	1218.2
0.017	41.0	0.33	1280.1
0.020	42.8	0.38	1332.8
0.023	44.3	0.43	1379.2
0.026	44.3	0.49	1378.4
0.029	46.6	0.54	1452.0
0.032	48.1	0.58	1497.6
0.035	49.2	0.64	1529.7
0.038	49.8	0.69	1549.2
0.040	51.1	0.74	1586.4
0.043	51.8	0.79	1608.5
0.046	52.8	0.84	1638.6
0.049	53.4	0.89	1656.6
0.052	54.6	0.94	1691.9
0.055	55.5	0.99	1720.4
0.058	56.2	1.05	1739.8
0.069	59.2	1.25	1828.2
0.081	62.1	1.45	1913.9
0.092	64.6	1.65	1987.1
0.104	67.0	1.85	2057.5
0.115	69.6	2.05	2134.4
0.127	72.0	2.25	2202.2
0.138	74.1	2.45	2261.8
0.150	76.5	2.65	2330.6
0.161	78.4	2.85	2385.0
0.189	84.2	3.35	2547.3
0.218	89.4	3.86	2691.2
0.247	94.8	4.36	2837.6
0.275	100.6	4.86	2995.6
0.330	111.7	5.81	3291.9
0.401	127.0	7.06	3692.4
0.472	143.7	8.31	4122.5
0.543	159.8	9.56	4523.2
0.615	173.4	10.81	4838.4
0.686	183.9	12.07	5059.3
0.758	190.2	13.32	5160.1
0.829	193.1	14.57	5162.5
0.900	194.7	15.82	5130.0
0.971	195.5	17.07	5073.6
1.043	197.0	18.32	5034.9
1.141	199.5	20.05	4990.4









UNCONSOLIDATED UNDRAINED COMPRESSION TEST - ASTM D2850

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job #: 2636-001.0 **Data Reduction:**

Boring # S0071R Sample #: MC27-1 Dial factor = 1.0 in/unit Depth (ft): 131 Load factor = 1.0 lb/unit

Date tested: 12/02/13

Soil: Greenish gray clay

Specimen:	Total wt. =	834.4	gms
	Ht. =	5.700	in
	Ave dia. =	2.420	in
	Area =	4.601	sq.in

Volume = 429.8 c.c.

Shearing rate = 0.03 inch/min

Shearing rate = 0.5 %/min

Gs (assumed) = 2.70

Test Report:	Void ratio=	0.781	
	Ht/Dia ratio=	2.36	_
	Moisture =	28.0	%
	Total density=	121.1	pcf
	Dry density =	94.6	pcf
	Saturation =	97.0	%
	Chamber pressure=	20160	psf
	Max. deviator stress=	10522	psf

Strain @ failure= 20.03

-0.002		0.00	0.0
0.003	27.8	0.07	870.1
0.006	27.8	0.13	869.6
0.009	27.8	0.18	869.2
0.003	27.7	0.10	863.8
0.014	36.6	0.28	1143.6
0.017	47.7	0.20	1488.0
0.020	54.2	0.38	1689.7
0.020	58.8	0.30	1831.9
0.025	58.8	0.49	1830.9
0.029	65.0	0.54	2024.2
0.032	67.9	0.58	2112.4
0.035	70.6	0.64	2194.5
0.038	72.9	0.69	2266.3
0.040	75.7	0.74	2352.4
0.044	77.8	0.79	2416.3
0.046	80.2	0.84	2487.8
0.049	83.2	0.89	2580.9
0.052	84.9	0.95	2633.3
0.055	87.9	1.00	2722.7
0.058	89.9	1.04	2784.8
0.069	99.9	1.25	3086.8
0.081	110.1	1.45	3395.9
0.092	120.8	1.65	3716.7
0.104	132.0	1.85	4055.9
0.115	142.7	2.05	4372.7
0.127	153.3	2.25	4689.0
0.138	163.2	2.45	4980.7
0.149	173.4	2.65	5283.7
0.161	182.8	2.85	5556.0
0.189	204.1	3.35	6171.8
0.218	222.4	3.86	6689.9
0.247	238.9	4.36	7149.7
0.275	252.1	4.86	7505.5
0.330	274.8	5.81	8098.8
0.401	298.3	7.06	8677.0
0.472	317.1	8.31	9099.5
0.544	334.3	9.57	9460.3
0.615	348.6	10.81	9728.3
0.686	362.1	12.07	9962.9
0.757	373.6	13.32	10134.4
0.829	382.8	14.57	10233.7
0.900	392.5	15.82	10339.9
0.972	402.3	17.07	10439.0
1.043	411.2	18.32	10510.3
1.140	420.5	20.03	10522.0

Axial

Strain

(%)

Load

Read. Read.

Dial

Deviator

Stress

(psf)









Direct Shear Moisture and Density Laboratory Results

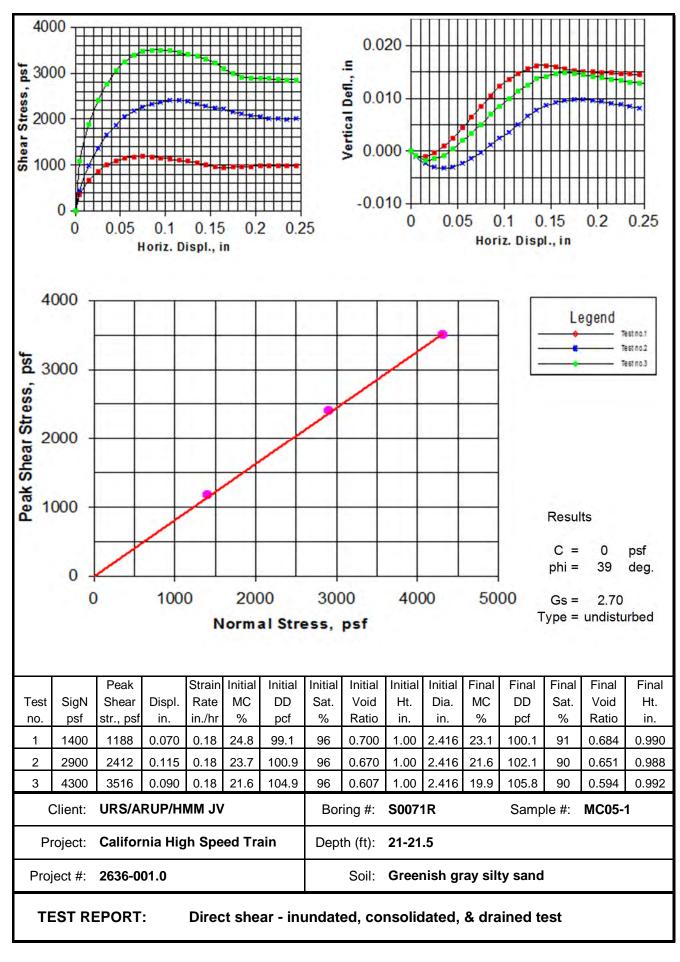
wet density (pcf) = 127.4

dry density (pcf) = 104.3

moisture (%) = 22.1

Client:	URS/ARUP/HMM JV	Boring #:	S0071R	Sample #:	MC05-1
Project:	California High Speed Train	Depth (ft):	21-21.5		
Project #:	2636-001.0	Soil:	Greenish gray	silty sand	

TEST REPORT: Direct shear - inundated, consolidated, & drained test



Direct Shear Moisture and Density Laboratory Results

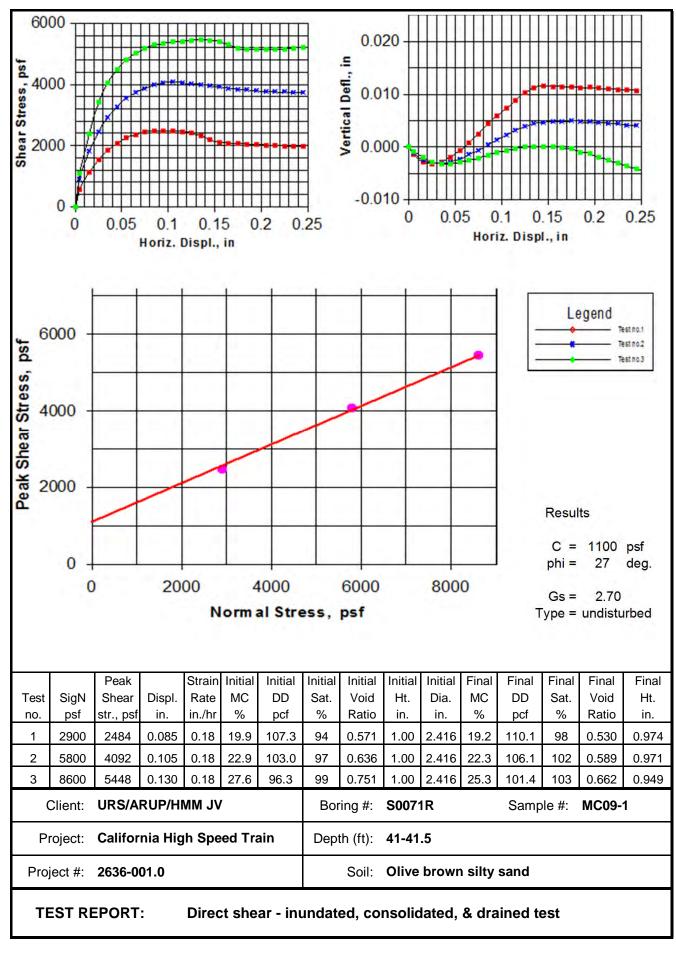
wet density (pcf) = 127.4

dry density (pcf) = 103.9

moisture (%) = 22.7

Client: URS/ARUP/HMM JV	Boring #:	S0071R	Sample #:	MC09-1
Project: California High Speed 1	Train Depth (ft):	41-41.5		
Project #: 2636-001.0	Soil:	Olive brown silty	sand	

TEST REPORT: Direct shear - inundated, consolidated, & drained test



Direct Shear Moisture and Density Laboratory Results

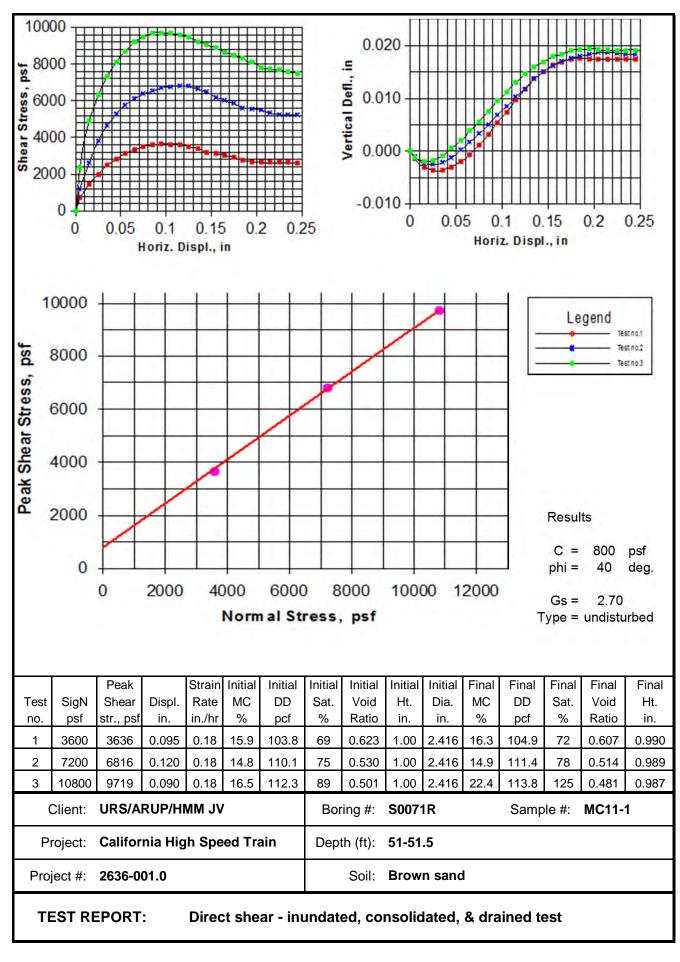
wet density (pcf) = 133.8

dry density (pcf) = 116.8

moisture (%) = 14.5

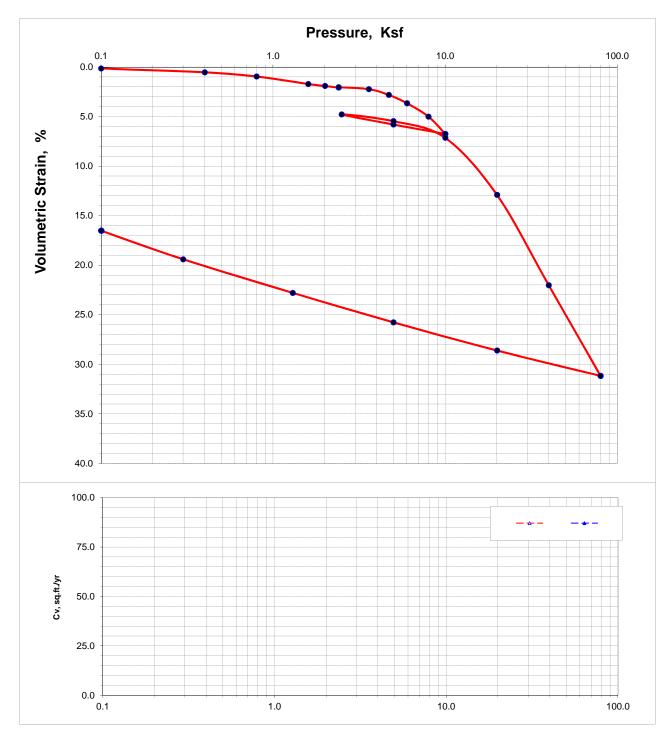
Client: URS/ARUP/HMM J	Borin	ng #: S0071R	Sample #:	MC11-1
Project: California High Spe	ed Train Depth	n (ft): 51-51.5		
Project #: 2636-001.0		Soil: Brown sa	nd	

TEST REPORT: Direct shear - inundated, consolidated, & drained test



CONSOLIDATION TEST

	Bori	ng Number	S0071R	0071R Sample Number MC25-1 Depth (ft) 123.0-123.5						
Soil Description Dark greenish gray clay with silt										
		Water Content, %	Total Unit Weight, pcf	Void Ratio	Saturation %	Height in	Diameter in	Specific Gravity	Liquid Limit, %	Plasticity Index, %
Ī	Initial	51.3	104.8	1.333	99.7	1.00		(assumed)		
	Final	36.8	113.5	0.948	100.6	0.835	2.420	2.59		





R - VALUE TEST ASTM D - 2844 / CAL 301

Project Number : 23502-ZS9

Project Name : CA HSR FRE_BAK

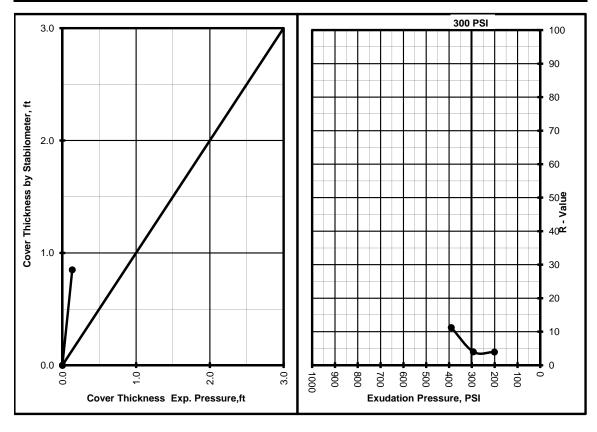
Date : 10/7/13

Sample Location/Curve Number : Boring S0071R,B-1 @ 0-5'

Soil Classification : CL - Untreated

TEST	А	В	С
Percent Moisture @ Compaction, %	13.0	12.0	14.1
Dry Density, lbm/cu.ft.	119.5	122.5	117.8
Exudation Pressure, psi	293	390	201
Expansion Pressure, (Dial Reading)	0	0.0004	0
Expansion Pressure, psf	0	0.001732	0
Resistance Value R	4	11	4

R Value at 300 PSI Exudation Pressure	(4)
R Value by Expansion Pressure (TI =): 5	Expansion Pressure Nil







R - VALUE TEST ASTM D - 2844 / CAL 301

Project Number : 23502-ZS9

Project Name : CA HSR FRE_BAK

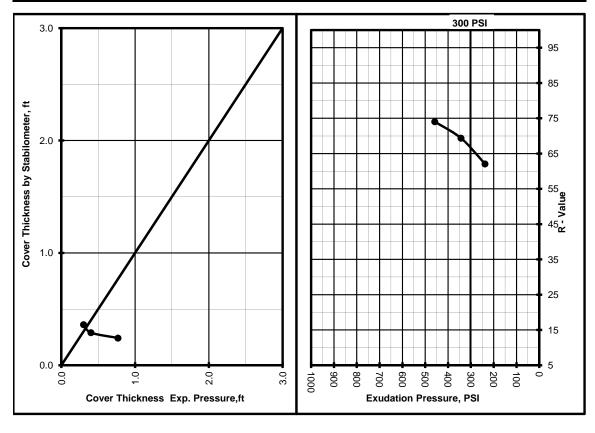
Date : 10/7/13

Sample Location/Curve Number : Boring S0071R,B-1 @ 0-5'

Soil Classification : CL- Treated w/ Quicklime Plus @ 4%

TEST	А	В	С
Percent Moisture @ Compaction, %	14.7	15.3	14.4
Dry Density, lbm/cu.ft.	117.5	116.7	119.0
Exudation Pressure, psi	343	238	458
Expansion Pressure, (Dial Reading)	0.0012	0.0009	0.0023
Expansion Pressure, psf	0.005196	0.003897	0.009959
Resistance Value R	69	62	74

R Value by Expansion Pressure (TI =): 5	(66)	
R Value at 300 PSI Exudation Pressure	67	





ASTM D - 1557

Project Number : 23502-ZS9

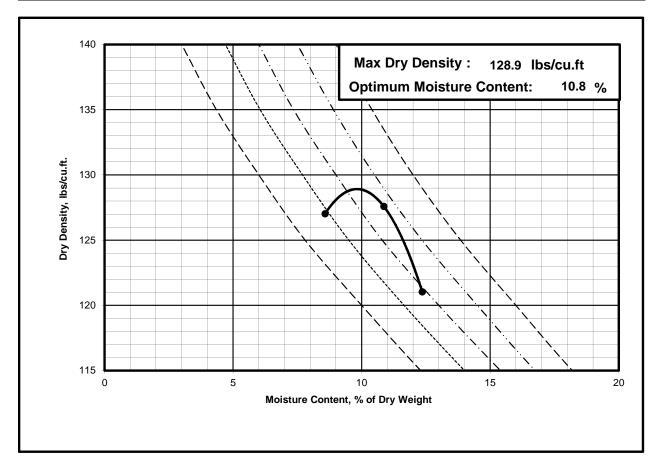
: CA HSR FRE_BAK **Project Name**

Date : 11/4/2013 Sample location : S0071R Sample/Curve Number : B01 0'-5'

Soil Classification : (CL) Sandy Clay

Test Method : 1557C

	1	2	3	4
Weight of Moist Specimen & Mold, gm	7668.6	7483.1	7548.8	
Weight of Compaction Mold, gm	2856.8	2856.8	2856.8	
Weight of Moist Specimen, gm	4811.8	4626.3	4692.0	
Volume of mold, cu. ft.	0.0750	0.0750	0.0750	
Wet Density, lbs/cu.ft.	141.4	136.0	137.9	
Weight of Wet (Moisture) Sample, gm	200.0	200.0	200.0	
Weight of Dry (Moisture)Sample, gm	180.4	178.0	184.2	
Moisture Content, %	10.9	12.4	8.6	
Dry Density, lbs/cu.ft.	127.6	121.0	127.0	



Organic Content ASTM D-2974 Method C

Client: URS/ARUP/HMM JV
Project Name: California High Speed Train
Project Number: 2636-001.0
Date 11/19/2013

Boring	S0071R	
Sample	SS26	
Depth	126.0-126.5	
Wet Soil + Tare	779.26	
Dry Soil + Tare	661.87	
Tare	355.8	
Moisture Content (%)	38.35	
Weight Before 440°C + Tare	508.96	
Weight After 440°C + Tare	497.6	
Tare	264.69	
Weight of Ash (After 440°C)	232.91	
Weight of Oven-Dried Soil	244.27	
Ash Content (%)	95.35	
Organic Matter (%)	4.65	

ASTM D-854 SPECIFIC GRAVITY OF SOILS REPORT

Client Name URS/HMM/ARUP JV
Project Name California High Speed Train
Project Number 2636-001.0

Boring Number	S0071R		
Sample Number	MC25-1		
Depth (ft)	123.0-123.5		
Date	12/03/13		
Flask ID	С		
Calibrated mass of dry pycnometer (gms)	176.22		
Calibrated volume of pycnometer (ml)	498.81		
Mass of pyc, water& soil (gms)	707.02		
Test Temperature (°C)	19.5		
Pan plus dry soil (g)	414.84		
Pan weight (g)	361.33		
Density of water at test temperature from			
ASTM D-854 Table 1 (g/cc)			
Temperature Coefficient from ASTM D-854			
Table 1(K)	1.00010		
Mass of pycnometer and water at test temp	0=4.40		
(gms)			
Mass of soil & solids (gms)			
	2.588		
Specific Gravity of soil solids at test			
temperature	2.588		

Chemical Analysis

SO₄ - Modified Caltrans 417 & CL - Modified Caltrans 417/422

SEG Project Number

: 1-513-0002

TES Project Number

: 23502-ZS9

Date

: 11/06/13

Sample Location

: S0071R: B01

Soil Classification

.

Sample Number	Soluble Sulfate SO ₄ -S	Soluble Chloride Cl		
S0071R: B01	430	mg/Kg	950	mg/Kg
S0071R: B01	440	mg/Kg	940	mg/Kg
S0071R: B01	440	mg/Kg	940	mg/Kg
Average	437	mg/Kg	943	mg/Kg





MINIMUM RESISTIVITY; ASTM G57

Project Name	CA HSR FRE_BAK	Sample Number	B01
Project Number	23502-ZS9	Sample Location	Boring S0071R
Sample Date	10/8/2013	Material Description	CL
Sampled By	M. Walker		

Sample Condition	As Received	Minimum Resistivity					
Water Added (ml)	0	50	100	150			
Resistance (ohm)	3,450	480	375	390			
Resistivity (ohm-cm)	3,674	511	399	415	0	0	0

Minimum Resistivity (ohm-cm)_399	Field Resistivity (ohm-cm)

